

**WHAT IS CLAIMED:**

- 5                   1.       An isolated nucleic acid molecule encoding a short  
                                  integuments1 protein.
- 10                   2.       An isolated nucleic acid molecule according to claim 1,  
                                  wherein the nucleic acid molecule encodes a protein having an amino acid  
                                  sequence of SEQ. ID. No. 2.
3.       An isolated nucleic acid molecule according to claim 1,  
                                  wherein the nucleic acid has a nucleotide sequence of SEQ. ID. No. 1.
- 15                   4.       An antisense nucleic acid molecule encoding a nucleic acid  
                                  sequence which is complementary to the DNA according to claim 1.
5.       An isolated nucleic acid molecule according to claim 1,  
                                  wherein the nucleic acid has a nucleotide sequence that is at least 55% similar to  
                                  the nucleotide sequence of SEQ. ID. No. 1 by basic BLAST using default  
20                   parameters analysis.
6.       An isolated nucleic acid molecule according to claim 1,  
                                  wherein the nucleic acid hybridizes to the nucleotide sequence of SEQ. ID. No. 1  
                                  under stringent conditions characterized by a hybridization buffer comprising  
25                   0.9M sodium citrate buffer at a temperature of 45°C.
7.       An expression vector comprising a transcriptional and  
                                  translational regulatory DNA operably linked to a DNA molecule according to  
                                  claim 1.
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                                  DNA molecule is in proper sense orientation and correct reading frame.

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9. A host cell transduced with nucleic acid according to claim

8-10. A host cell according to claim <sup>7</sup>9, wherein the cell is selected

5 from a group consisting of a bacterial cell, a virus, a yeast cell, and a plant cell.

11. A plant cell according to claim 10, wherein the nucleic acid molecule either 1) encodes an amino acid having SEQ. ID. No. 2, 2) has a nucleotide sequence of SEQ. ID. No. 1, 3) is at least 55% similar to the nucleotide sequence of SEQ. ID. No. 1 by basic BLAST using default parameters analysis, or 4) hybridizes to the nucleotide sequence of SEQ. ID. No. 1 under stringent conditions characterized by a hybridization buffer comprising 0.9M sodium citrate buffer at a temperature at a temperature of 45°C.

15 9-12. A transgenic plant transduced with the nucleic acid according to claim 1.

13. A transgenic plant according to claim 12, wherein the nucleic acid molecule either 1) encodes an amino acid having SEQ. ID. No. 2, 2) has a nucleotide sequence of SEQ. ID. No. 1, 3) is at least 55% similar to the nucleotide sequence of SEQ. ID. No. 1 by basic BLAST using default parameters analysis, or 4) hybridizes to the nucleotide sequence of SEQ. ID. No. 1 under stringent conditions characterized by a hybridization buffer comprising 0.9M sodium citrate buffer at a temperature of 45°C.

25 10-14. A transgenic plant seed transduced with the nucleic acid according to claim 1.

15. A transgenic plant seed according to claim 14, wherein the nucleic acid molecule either 1) encodes an amino acid having SEQ. ID. No. 2, 2) has a nucleotide sequence of SEQ. ID. No. 1, 3) is at least 55% similar to the nucleotide sequence of SEQ. ID. No. 1 by basic BLAST using default parameters analysis, or 4) hybridizes to the nucleotide sequence of SEQ. ID. No. 1 under

stringent conditions characterized by a hybridization buffer comprising 0.9M sodium citrate buffer at a temperature of 45°C.

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16. An isolated short integuments1 protein.

17. An isolated protein according to claim 16, wherein the protein has an amino acid sequence of SEQ. ID. No. 2.

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18. A method of regulating flowering in plants comprising:  
transducing a plant with a DNA molecule according to  
claim 1 under conditions effective to regulate flowering in the plant.

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19. A method according to claim 18, wherein the nucleic acid molecule either 1) encodes an amino acid having SEQ. ID. No. 2, 2) has a nucleotide sequence of SEQ. ID. No. 1, 3) is at least 55% similar to the nucleotide sequence of SEQ. ID. No. 1 by basic BLAST using default parameters analysis, or 4) hybridizes to the nucleotide sequence of SEQ. ID. No. 1 under stringent conditions characterized by a hybridization buffer comprising 0.9M sodium citrate buffer at a temperature of 45°C.

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20. A method of increasing fertility in plants comprising:  
transducing a plant with a DNA molecule according to  
claim 1 under conditions effective to increase fertility in the plant.

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21. A method according to claim 20, wherein the nucleic acid molecule either 1) encodes an amino acid having SEQ. ID. No. 2, 2) has a nucleotide sequence of SEQ. ID. No. 1, 3) is at least 55% similar to the nucleotide sequence of SEQ. ID. No. 1 by basic BLAST using default parameters analysis, or 4) hybridizes to the nucleotide sequence of SEQ. ID. No. 1 under stringent conditions characterized by a hybridization buffer comprising 0.9M sodium citrate buffer at a temperature of 45°C.

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22. A method of increasing fecundity of plants comprising:

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transducing a plant with a DNA molecule according to  
claim 1 under conditions effective to increase fecundity of the plant.

23. A method according to claim 22, wherein the nucleic acid  
5 molecule either 1) encodes an amino acid having SEQ. ID. No. 2, 2) has a  
nucleotide sequence of SEQ. ID. No. 1, 3) is at least 55% similar to the nucleotide  
sequence of SEQ. ID. No. 1 by basic BLAST using default parameters analysis, or  
4) hybridizes to the nucleotide sequence of SEQ. ID. No. 1 under stringent  
conditions characterized by a hybridization buffer comprising 0.9M sodium citrate  
10 buffer at a temperature of 45°C.

24. A method of decreasing fertility in plants comprising:  
transducing a plant with a DNA molecule according to  
claim 1 mutated to cause disruption of the DNA molecule under conditions  
15 effective to decrease fertility.

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25. A method according to claim 24 wherein a plant is  
transduced with a DNA molecule which encodes either 1) an antisense nucleic  
acid complementary to the nucleic acid molecule that encodes an amino acid  
20 having SEQ. ID. No. 2, 2) an antisense nucleic acid complementary to the  
nucleotide sequence of SEQ. ID. No. 1, 3) an antisense nucleic acid  
complementary to a nucleic acid molecule that is at least 55% similar to the  
nucleotide sequence of SEQ. ID. No. 1 by basic BLAST using default parameters  
analysis, or 4) hybridizes to the nucleotide sequence of SEQ. ID. No. 1 under  
25 stringent conditions characterized by a hybridization buffer comprising 0.9M  
sodium citrate buffer at a temperature of 45°C.